Environmental Management System

ISO 14001: 2015 Certification

Environmental Management System Manual

(Version 03)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University under section 3 of UGC Act 1956)

www.srmist.edu.in

Kattankulathur, Chengalpattu District – 603 203

Tamil Nadu, India

Version control

S.No	Description	Version	With effect from	Approved by
1	EMS Manual	01	22.11.2022	Registrar
2	The following revisions are made in this version • EMS Scope • Environmental policy • EMS Objectives • Roles and responsibilities • Annexures are removed from the EMS Manual • Annexures are mentioned as separate attachments • Risk assessment is separately presented in annexure	02	03.03.2023	Registrar
3	The following revisions are made in this version • EMS objectives of 2024-25 is included. • Annexure are updated	03	18.05.2024	Registrar

Prepared by	Verified by	Approved by
Dr. S. Gopinath	Dr. V. Thirumurugan	Prof. S. Ponnusamy
M.R. ISO 14001:2015	EMS Coordinator	Registrar

Table of Contents

1. CLARIFICATION OF CONCEPTS

environmental surroundings – in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships.

environmental aspect – element of an organization's activities or products or services that interacts or can interact with the environment.

environmental impact – change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.

interested parties – are the internal and external stakeholders whose actions can directly or indirectly influence the EMS performance

top management – person or group of people who directs and controls an organization at the highest level

cross functional team (CFT) – members of organization who are responsible for representing their area or department in several facets of the EMS.

operational heads – reporting authority to whom the CFT reports

operation controls – shall be a procedure, work instructions, physical controls, use of competent personnel, or any combination of these.

compliance obligations – legal requirements that an organization has to comply with and other requirements that an organization has to or chooses to comply with

intended outcomes – is what the organization intends to achieve by implementing its environmental management system.

nonconformity – non-fulfilment of a requirement which can be stated in relation to the environmental management system or in terms of environmental performance.

corrective action – action to eliminate the cause of a nonconformity and to prevent recurrence

continual improvement – recurring activity to enhance performance

risks and opportunities – potential adverse effects (threats) and potential beneficial effects (opportunities)

competence – ability to apply knowledge and skills to achieve intended results

effectiveness – extent to which planned activities are realized and planned results achieved

indicator – measurable representation of the condition or status of operations, management or conditions

monitoring – determining the status of a system, a process or an activity without using an equipment

measurement – process to determine a value using an equipment

performance – measurable result

environmental performance – performance related to the management of environmental aspects

standards – requirements as mentioned in ISO 14001:2015

In this EMS policy, the following verbal forms are used:

"**shall**" indicates a requirement (mandatory);

"**should**" indicates a recommendation;

"**may**" indicates a permission;

"**can**" indicates a possibility or a capability.

"**retain** documented information as evidence of" to mean records

"**maintain** documented information" to mean documentation other than records.

2. INTRODUCTION

Universally, initiatives are increasing toward protecting the environment and attaining a sustainable future. The adverse impact of current climatic conditions pushes humanity to adopt a systematic framework to protect the environment and achieve sustainability or to experience massive extinction. Considering this scenario, several organizations attempt to implement and maintain an environmental management system integrated with their business processes to protect the environment.

SRM Institute of Science and Technology (SRMIST) ensures that it continues to conduct its activities and processes proactively, environmentally accountable, and socially acceptable. The environmental management system (EMS) of SRMIST aims to minimize the environmental impact by protecting the environmental conditions and reducing the adverse environmental effects. Implementing ISO 14001:2015 certification for the EMS will provide a systematic framework to establish and maintain effective EMS. A guideline – EMS manual is highly imperative to develop the EMS framework as per the standard requirement.

3. ENVIRONMENTAL MANAGEMENT SYSTEM MANUAL

Environmental management system manual presents the detailed framework per the standard requirements of ISO 14001:2015 to plan, perform, monitor and control, and direct the actions to implement EMS in the SRMIST. The EMS manual presents the guidelines to protect the environmental conditions and improve them in the campus life of SRMIST. The top management reviews the EMS manual annually based on the appropriate requirements by the top management. The organization of the EMS manual consists of the following sections:

4. Context of the organization
5. Leadership
6. Planning
7. Support
8. Operation
9. Performance evaluation
10. Improvement

4. CONTEXT OF THE ORGANIZATION

4.1 Understanding the orgnaization and its context

SRM Institute of Science and Technology has a strong pedestal of 53,000 students supported by about 3,200 faculty across five campuses. Among the various higher education institutions in India, SRMIST has the dual advantage of scale and breadth of offerings, thereby holding a privileged position among its peers. SRMIST is one of the pioneering private institutions in the country and has the highest grade of "A++" by the National Assessment and Accreditation Council (NAAC), besides being labeled as a Category 1 University by the Ministry of Education (MoE)/UGC. The Quacquarelli Symonds (QS), a renowned ranking agency, has renewed its overall four-star rating in conjunction with five-star ratings in the genres of Teaching, Employability, Online Learning, Innovation, and Social Responsibility.

VISION

Emerge as a world-class university in creating and disseminate knowledge, and providing it's students with a unique learning experience in Science, Technology, Medicine, Management and other areas of scholarship that will best serve the world and betterment of mankind.

MISSION

- MOVE UP through international alliances and collaborative initiatives to achieve global excellence.
- ACCOMPLISH A PROCESS to advance knowledge in a rigorous academic and research environment.
- ATTRACT AND BUILD PEOPLE in a rewarding and inspiring environment by fostering freedom, empowerment, creativity and innovation.

A well conceptualized strategic plan provides the roadmap towards the realization of vision through the mission. The strategic plan is envisaged through six pillars:

1. Academic Excellence
2. Research Excellence
3. Capacity Building – Faculty and Students
4. Global Visibility and Collaboration
5. Innovation, Incubation and Entrepreneurship

6. Sustainability and Development

To establish, implement, maintain and continually improve an environmental management system, the organization should determine the context within which it operates. The context includes the external and internal issues, including environmental conditions relevant to its purpose, which affect its ability to achieve the intended outcomes of the environmental management system. The term "intended outcome" means what the organization plans to achieve by implementing its environmental management system. The top management of SRMIST explored its external and internal issues that can positively or negatively affect the organization. The identified external and internal issues are presented in annexure 1. The organization structure of EMS is presented in figure 1.

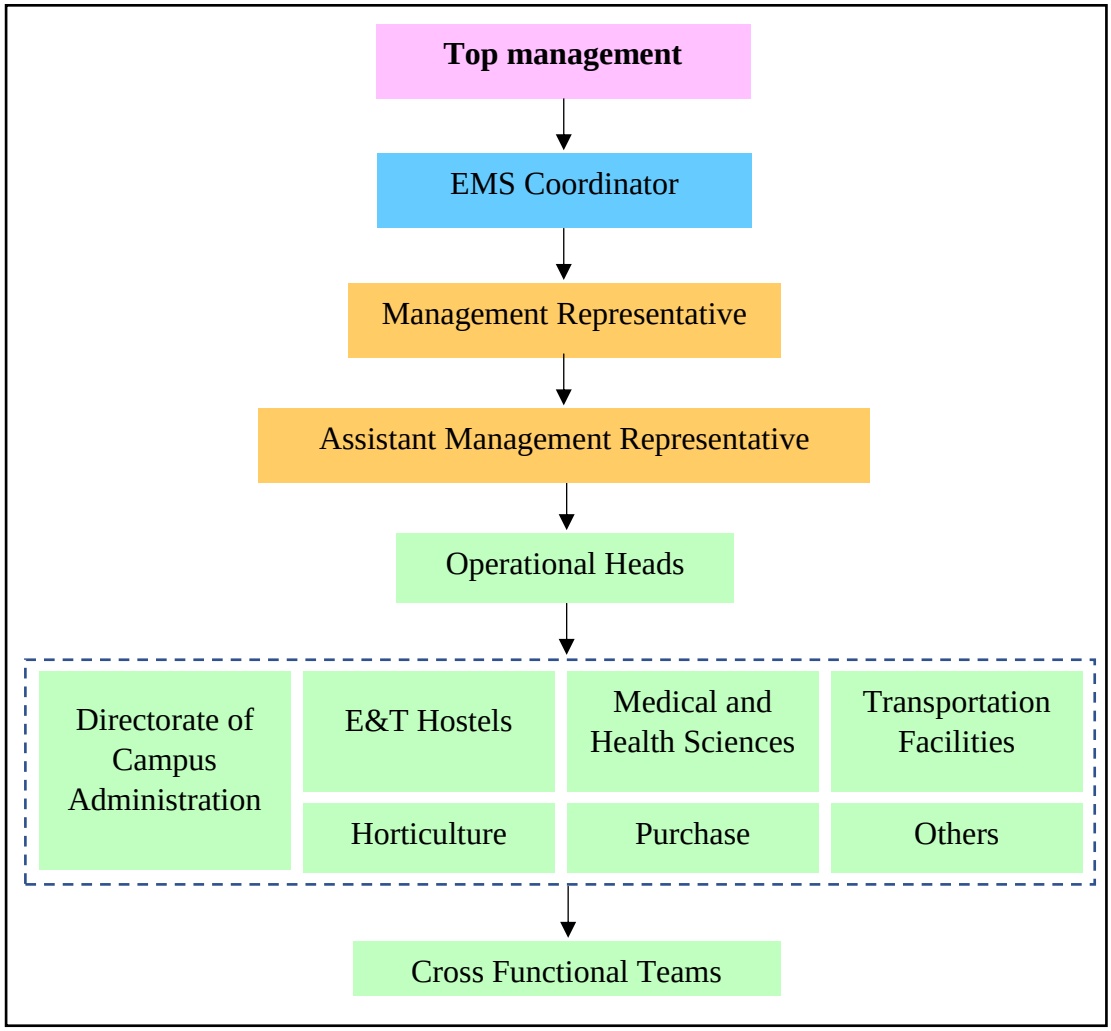

Figure 1. EMS Organization sturucture

4.2 Understanding the needs and expectaions of interested parties

The needs and expectations of the interested parties represent the requirement of environmental consideration that the organization shall include while developing the EMS (Annexure 4). The top management of SRMIST identified the interested parties. The primary interested parties are students, faculties, and staff involved in the administrative activities. The other interested parties are the regulatory or statutory agencies, industry membership organizations, neighbouring communities, contractors, non-governmental organizations (NGOs), and others. The interested parties were surveyed to determine their needs and expectations.

The operational heads shall review the received needs and expectations in the organization. After the review, the relevant needs and expectations are considered while formulating the environmental objectives. Wherever the interested parties expressed their unsatisfactory opinion about the specific environmental impacts shall be considered as compliance obligations by the organization. The needs and expectations shall be annually reviewed and updated as per the requirement of the standard.

4.3 Scope of the environmental management system

The primary function of SRM Institute of Science and Technology is academics. The scope of the environmental management system is intended to clarify the physical and organizational boundaries to which the environmental management system applies. The organization considers the extent of control or influence it can exert over activities, products, and services, considering a life cycle perspective. The scope's physical boundaries comprise the main campus, annexure campus, medical campus, and hostels. The activities/services performed in the phycial boundaries are as follows

- Electricity consumption - state electricity board
- Electricity consumption - diesel generator
- Electricity generation - solar
- Water treatement – Reverse Osmosis
- Waste water treatment – Sweage treatment plants and effluent treatment plants
- Water harvesting facilities
- Solar steam generation
- Oxygen production unit

- Bio-gas generation
- Air handling units
- Firefighting service
- Transportation facilities
- Horticulture activities
- Waste management
- Civil, MEP and Housekeeping services

4.4 Environmental management system

The top management of SRMIST established the environmental management system to achieve the intended outcomes and enhance its environmental performance. The EMS shall be implemented, maintained, and continually improved following the requirements of the international standard ISO14001:2015. The interaction of the Plan-Do-Check-Act cycle with the elements of the standard is presented in figure 2.

The planning activities/processes are as follows:

1. Understand the organization and its context, including the needs and expectations of interested parties
2. Determine the scope and implement the environmental management system
3. Ensure leadership and commitment from top management
4. Establish an environmental policy
5. Assign responsibilities and authorities for relevant roles
6. Determine environmental aspects and associated environmental impacts
7. Identify and have access to compliance obligations
8. Determine the risks and opportunities that need to be addressed related to bullets 1), 6) and 7) above
9. Plan to take actions to address risks and opportunities determined in 8) above, and evaluate effectiveness of these actions
10. Establish environmental objectives and define indicators and a process to achieve them

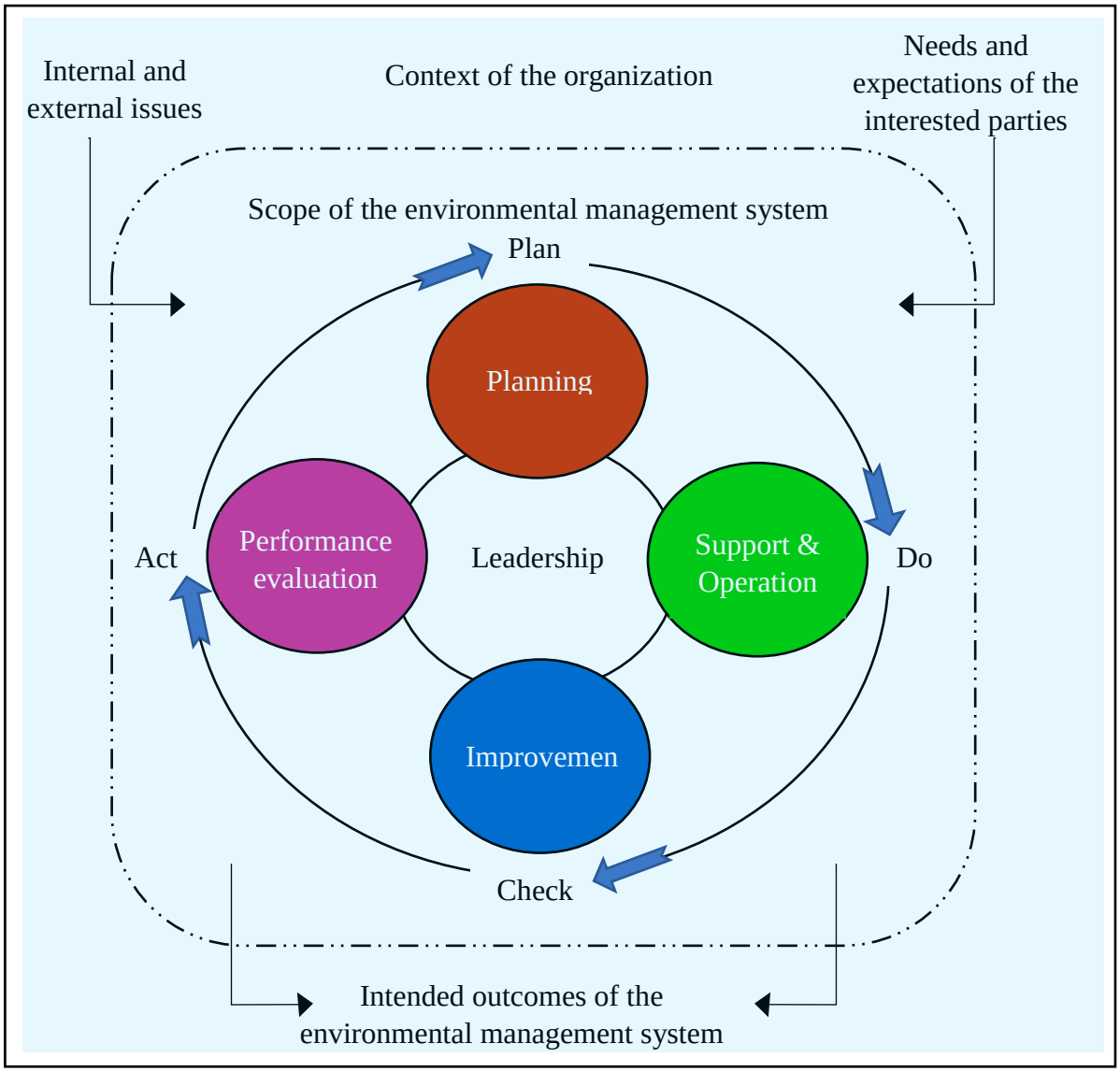

Figure 2. Relationship between PDCA and the framework

The do activities/processes are as follows:

1. Determine the resources required to implement and maintain the environmental management system
2. Determine the necessary competence of person(s) and ensure these persons have the competency and awareness as determined
3. Establish, implement and maintain the processes needed for internal and external communications
4. Ensure an appropriate method for creating and updating and controlling documented information
5. Establish, implement and control operational control processes needed to meet the environmental management system requirements

The check activities/processes activities are as follows:

1. Monitor, measure, analyze and evaluate environmental performance
2. Evaluate fulfilment of compliance obligations
3. Conduct periodic internal audits
4. Review the organization's environmental management system to ensure continuing suitability, adequacy and effectiveness

The act – activities/processes are as follows:

1. Take action to deal with nonconformity
2. Take action to continually improve the suitability, adequacy and effectiveness of the environmental management system to enhance environmental performance.

5. LEADERSHIP

5.1 Leadership and commitment

The Founder Chancellor, Pro-chancellor administration, and Pro-chancellor academics are the ultimate reporting body for SRMIST. The Vice-chancellor and Registrar are the highest authority to direct the EMS of SRMIST. Top management's commitment, accountability, and leadership are vital for successfully implementing an effective environmental management system, including the capability to achieve intended outcomes. The top management of SRMIST retains accountability and demonstrates commitment to the environmental management system by:

- Taking accountability for the effectiveness of the environmental management system
- Ensuring that the environmental policy and environmental objectives are established and are compatible with the strategic direction and the context of the organization
- Ensuring the integration of the environmental management system requirements into the organization's business processes
- Ensuring that the resources needed for the environmental management system are available
- Communicating the importance of effective environmental management and of conforming to the environmental management system requirements
- Ensuring that the environmental management system achieves its intended outcomes

- Directing and supporting persons to contribute to the effectiveness of the environmental management system
- Promoting continual improvement
- Supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility

The top management formulates an environment policy to effectively implement, maintain, and improve the EMS.

5.2 ENVIRONMENT POLICY

The environmental policy of SRM Institute of Science and Technology, Kattankulathur Campus, defines the strategic direction to perform all activities/processes concerning environmental considerations. This environmental policy contributes to the institute's broader commitment to social responsibility.

The environment policy of SRM Institute of Science and Technology is to:

- Protect the environment by utilizing natural resources efficiently through reduce, reuse and recycle processes.
- Minimize the significant environmental impacts through integrated environmental management processes and planning.
- Adopt the pollution hierarchy approach to prevent pollution through source reduction, reuse (or) recycling, recovery, treatment, and controlled disposal.
- Mitigate climate change with reduced emission of greenhouse gases.
- Maintain the necessary compliance obligations related to the state and central legislations.
- Purchase of eco-friendly materials from authorized dealers with life cycle considerations.
- Attain continual improvement to improve the efficiency of EMS to enhance environmental performance.
- Protect the bio-diversity, habitats, and ecosystem through direct on-site conservation in the neighbouring locations.

All activities/processes associated with the environment will be performed as per the standards of ISO 14001:2015. Based on the environmental policy, EMS objectives will be framed. The performance against the EMS Objectives will be reported annually to the top management. All the students, research scholars, teaching and non-teaching staff, and other external stakeholders share this responsibility in maintaining the EMS. They are therefore required to adopt the standards, objectives, and procedures of EMS wherever applicable.

Prof. S. Ponnusamy, Ph.D
Registrar
[May 2024]

5.3 Organizational roles, responsibilities and authorities

The top management of SRMIST ensures that the responsibilities and authorities for relevant roles are assigned and communicated within the organization. The top management communicates the roles and responsibilities of the individuals related to the EMS to the organization. The roles and responsibilities are established to ensure that EMS conforms to the standard requirements. The roles and responsibilities are presented in the annexure 2.

6. PLANNING

6.1 Actions to address risks and opportunities

6.1.1 General

The risks and opportunities of the EMS are to be established to ensure that the organization can achieve the intended outcomes of its environmental management system, prevent or reduce undesired effects, and achieve continual improvement. The risks and opportunities are identified with the consideration of the issues, requirements, and scope of EMS.

SRMIST adopted a qualitative assessment to determine the risk and opportunities associated with the environmental aspects, compliance obligations, and other issues. The scope of emergencies is also considered while identifying the risk and opportunities. The risk identification register is presented in annexure 5. Emergencies are unplanned or unexpected events that need the urgent application of specific competencies, resources, or processes to prevent or mitigate their actual or potential consequences. Emergencies can result in adverse environmental impacts or other effects on the organization.

6.1.2 Environmental aspects

Within the scope of the environmental management system, the SRMIST determines the environmental aspects of its activities, products, and services that it can control and those that it can influence and their associated environmental impacts, considering a life cycle perspective. All the possible environmental aspects and their impacts were explored. The pertinent aspects were further analyzed in the normal, abnormal, and emergency conditions to perform a risk identification. Risks (negative impacts) and opportunities (positive impacts) were identified based on their impacts. The values of the probability of occurrence (PoO) and severity of the negative and positive

impacts were allotted for every impact with inputs from the cross-functional team members. The life cycle consideration of the activity/product/services is presented in annexure 3 and environmental impact assessment is presented in annexure 6. Also, environmental process map is established for all the activities considering the life cycle perspective (Annexure 12).

6.1.3 Compliance obligations

Compliance obligations are the legal requirements that an organization has to comply with any other conditions that the organization has to or chooses to comply with. The legal aspects include the acts, rules, and guidelines applicable to the scope of EMS from the central and state pollution control boards and the respective ministries. Compliance obligations also include the expectations of the interested parties' requirements. Compliance obligations can result in risks and opportunities that need to be addressed.

The top management of SRMIST assessed the activities/processes performed in campus life at a sufficiently detailed level and determined the compliance obligations that apply to its environmental aspects. The compliance register applicable to the scope of EMS is presented in annexure 7.

Mandatory compliance obligations are the

- Requirements from governmental entities or other relevant authorities
- International, national and local laws and regulations
- Requirements specified in permits, licenses or other forms of authorization
- Orders, rules or guidance from regulatory agencies
- Judgements of courts or administrative tribunals

6.1.4 Planning action

The top management of SRMIST determines the actions to address the significant aspects, compliance obligations, risks, and opportunities. Also, how to integrate and implement the actions by providing the necessary support for the operation and monitoring phase of the environmental management system processes. While planning the actions, the top management of SRMIST considers the technological options the EMS performance, such as air and noise measuring devices, occupancy sensors to automate

the usage of electrical services, electromagnetic flow meters, online effluent monitoring systems, and others, along with its financial aspects for their operational requirement.

6.2 Environmental objectives

The top management of the SRMIST establishes environmental objectives at relevant functions and levels, fulfilling the commitments set in its environmental policy, considering the organization's significant environmental aspects and associated compliance obligations, and considering the risks and opportunities. The environmental objectives shall be categorized into three levels: strategic, tactical, and operational. The environmental objectives shall be reviewed and updated annually or on appropriate needs. The objectives of the EMS is presented in the table 1.

6.2.1 Planning actions to achieve environmental objectives

The top management sets the tactical environmental objectives, targets to attain, performance indicators, and key actions. The operational heads shall plan it accordingly to achieve the intended objectives within the intended duration. The operational heads assign the appropriate personnel, determines the resources and support required from the top management, implements the actions, and submits the progress on a monthly/quarterly/half-yearly basis for the relevant environmental aspects.

The operational heads can modify or add the key actions if required to ensure the attainment of intended outcomes.

Table 1. EMS Objectives

Obj. No.	EMS Objectives	Target	Due date
Primary Objectives:			
1	To quantify energy use intensity of every building and other facilities	Every buildings and facilities	17.05.2025
2	To quantify the water use intensity of every buildings and other facilities	Every buildings and facilities	
3	To maintain the qualitative parameters of air, water, and noise levels	Within permissible limits	
Secondary Objectives:			
1	To increase the electricity consumption through renewables	5%	17.05.2025
2	To minimize the diesel consumption for transit facilities	3%	
3	To increase the recycling recovery rate	10%	
4	To minimize the LPG consumption through biogas and solar steam	2%	
5	To conduct training programs for the CFT members	10 Nos.	
Long-term Objectives (5-year):			
1	To minimize energy use intensity of every building	5%	17.05.2029
2	To increase the electricity consumption through renewables	15%	
3	To minimize the water consumption	5%	
4	To increase the recovery rate from solid waste management	40%	
5	To minimize the diesel consumption for transit facilities	10%	
6	To minimize the LPG consumption through biogas and solar steam	10%	
7	To increase the number of trees	3%	

7. SUPPORT

7.1 Resources

Resources are needed to function effectively, improve the environmental management system, and enhance environmental performance. The top management of SRMIST should ensure that those with environmental management system responsibilities are supported with the necessary resources. The resource allocations are to be continuously reviewed in the management reviews, and appropriate actions are to be taken by the top management.

Resources can include

- Human resources equipped with skills and knowledge
- Natural resources such as water and air
- Infrastructure such as organization buildings, equipment's, drainage facilities, storage tanks, and other related services
- Technology based devices and applications to measure the qualitative parameters of air, noise, waster, performance outcome of activities, and to assist digital data collection for better decision making.
- Financial resources required to provide the resources

7.2 Competence

Competence indicates the exhibit of applied knowledge and skill by the persons working under the organization's control which affects its environmental performance. The top management ensures that the people involved in the EMS are sufficiently equipped with the necessary competence by providing training from the certified bodies and evaluating their competence. As per the standard requirement, competence is to be provided for the people:

a) whose work has the potential to cause a significant environmental impact

b) who are assigned responsibilities for the environmental management system, including those who:

- Determine and evaluate environmental impacts or compliance obligations
- Contribute to the achievement of an environmental objective
- Respond to emergency situations
- Perform internal audits

- Perform evaluations of compliance

7.3 Awareness

The top management is responsible for building awareness in an organization concerning the environmental management system and environmental performance to enhance knowledge and promote behaviour that supports the organization's environmental policy commitments. This includes making employees and other persons working under the organization's control aware of the organization's environmental values and how these values can contribute towards the organization's business strategy. The SRMIST ensure that employees under the organization's control are aware of:

- the environmental policy
- the significant environmental aspects and related actual or potential environmental impacts associated with their work
- their contribution to the effectiveness of the environmental management system, including the benefits of enhanced environmental performance
- the significant actual or potential environmental aspects and associated environmental impacts of their work activities
- identified risks and opportunities that need to be addressed in relation to their work activities, if applicable
- the implications of not conforming with the environmental management system requirements, including not fulfilling the organization's compliance obligations

The awareness may be created through internal communication using e-mails, displaying visual signs and banners at appropriate places, publishing the EMS newsletter, conducting campaigns, training or education, and mentoring.

7.4 Communication

7.4.1 General

Communication allows the organization to provide and obtain information relevant to its environmental management system. Communication is a two-way process, in and out of the organization. The top management of SRMIST should communicate within and outside the organization about the importance of effective environmental management and conformance with the environmental management system requirements. The interested parties and stakeholders shall mention their suggestions and

feedback to the official EMS e-mail id: iso14001cl@srmist.edu.in or submit the proactive risk and opportunity form (annexure 8) to the office of the EMS Coordinator. The management representative shall maintain the documented information about the internal communications.

7.4.2 Internal communication

The top management communicates the following information relevant to the EMS to the interested parties and stakeholders internally among the various levels and functions of the organization.

Main elements to communicate within the organization:

- The environmental policy
- The responsibilities and authorities for relevant roles
- The significant environmental aspects among the various levels and functions of the organization, as appropriate
- The environmental objectives
- The relevant environmental requirement(s) to external providers and legislative bodies
- Communications required by its compliance obligations
- The results of internal audits are reported to relevant management
- The performance reports of ems
- The operational process
- Top management's review of the organization's environmental management system should include consideration of communication(s) from interested parties

The internal communications shall be made through e-mails, notifications, the EMS newsletters and other appropriate mediums.

7.4.3 External communications

Communication with external interested parties can be an essential and effective tool for EMS. The top management communicates the following information to the external interested parties such as contractors, legislative representatives, suppliers, and other stakeholders.

The main elements for the external communication are:

- The environmental policy
- The environmental objectives
- The communications provided to the legislative bodies
- The operational process
- The performance report of EMS

External communications shall be made using the organization's website, media, e-mails, and other appropriate mediums.

7.5 Documented information

7.5.1 General

The standard recommends creating and maintaining documented information in a manner sufficient to ensure a suitable, adequate, and effective environmental management system. The primary focus should be on implementing the environmental management system and environmental performance, not on a complex documented information control system. Documented information can be controlled in any medium (paper, electronic, photos, and posters) that is useful, legible, easily understood, and accessible to those needing the information. The standard suggests that certain information which changes regularly is to be maintained as documented information and certain information which changes periodically are to be retained as records. The documented information and records are available with the control of the respective authorities.

The organization should maintain the following as documented information:

- The scope of the environmental management system
- The environmental policy
- Its identified risks and opportunities that need to be addressed
- The processes needed in 6.1.1 to 6.1.4, to the extent necessary to have confidence that these processes are carried out as planned
- Its environmental aspects and associated environmental impacts, the criteria used to determine its significant environmental aspects, and its significant environmental aspects
- Its compliance obligations
- Information on the environmental objectives

- Information related to the operational control processes needed to meet environmental management system requirements, to the extent necessary to have confidence that the processes have been carried out as planned
- The processes needed to prepare for and respond to potential emergency situations identified in 6.1.1, to the extent necessary to have confidence that the processes are carried out as planned

The organization should retain documented information as evidence (records) of the following:

- competence, as appropriate
- its communications, as appropriate
- monitoring, measurement, analysis and evaluation results, as appropriate;
- compliance evaluation result(s)
- implementation of the audit programme, and the audit results
- the results of management reviews
- the nature of identified nonconformity and any subsequent actions taken, and the results of any corrective action.

7.5.2 Creating and updating

The essential documents related to the EMS are included in the EMS manual. Additional documents, if necessary, will be prepared by the EMS Coordinator and shared after the approval for suitability from the top management. The documented information is maintained in the English language and maintained in both digital and printed formats. The documented information shall have the title, date, author, version number, and with effect from, if any, visibly printed. Whenever a specific document is revised or updated as per the requirement mentioned in table 2, its latest version will be communicated to the stakeholders; the earlier versions of the document remain void.

Table 2. Update frequency of documents

S.No	Description	Update frequency
1	EMS Manual	Annually
2	EMS Policy	
3	Needs and expectations of the interested parties	
4	Risk and opportunities	
5	Aspect impact study	

S.No	Description	Update frequency
6	Environmental objectives	
7	Emergency preparedness and response procedure	
8	Audit reports and management review reports	Based on its occurrences
9	Abnormal and emergency incidents report	
10	Progress reports	Monthly/quarterly/half yearly/annually
11	Compliance obligations	Regularly or whenever as decided by the top management
12	Documented information	
13	Test reports	
14	Operational control processes	
15	Roles and responsibilities	Periodically or whenever as decided by the top management
16	Non-conformity report	
17	Proactive risk and opportunity form	Regularly

7.5.3 Control of documented information

The documented information required by the standard is controlled to ensure that:

a. it is available and suitable for use where and when it is needed
b. it is adequately protected (e.g., from loss of confidentiality, improper use, or loss of integrity).

The documented information maintained shall be stored for minimum 3 years and disposed off appropriately.

8. OPERATION

8.1 Operational planning and control

The top management establishes, implement, control, and maintain the processes (a set of interrelated or interacting activities which transforms input to output) to meet the EMS requirements and implement the actions as per the objectives. The operational planning and control shall be performed by establishing operating criteria for the process(es) and implementing the control of the process(es) under the operating criteria.

8.1.1 *Operational process for the activities/services related to EMS Scope.*

The operational heads should ensure the following operational process are performed in their scope and communicated to the management representative.

- Establish the operational controls – operation controls shall be a procedure, work instructions, physical controls, use of competent personnel, or any combination of these.
- Establish the operational criteria as the standard operating procedure for every activity/service as per the EMS scope.
- The operational controls shall be implemented as per the following hierarchy.
    - elimination, such as banning the use of single use plastics and other such products.
    - substitution, such as a change of solvent-based paint to water-based paint
    - engineering controls, such as emission controls, abatement technology, etc.
    - administrative controls, such as procedures, visual controls, work instructions, and safety data sheets
- Measure, monitor, evaluate, and report the implementation of operational controls at progress meetings.
- Determine and obtain the resources, budget, and support required for every significant environmental aspect.
- Determine the essential competence required for the personnel and provide them.
- Conduct the progress update meeting to attain every objective regularly (minimum one meeting in the fourth week of every month) and report the progress to the management representative.

8.2 Emergency preparedness and response

The emergency preparedness and response procedure shall be made available for all the relevant emergency conditions identified in the environmental aspect-impact assessment. The emergency preparedness and response plan are presented in annexure 9. The procedure will be made available for all the relevant personnel in their places. All the reports of actual emergency conditions and response actions shall be communicated to the EMS Coordinator on their occurrence. The operational heads shall maintain the

documented information to the extent necessary to have confidence that the process(es) is (are) carried out as planned.

9. PERFORMANCE EVALUATION

9.1 Monitoring, measurement, analysis and evaluation

9.1.1 General

An organization should regularly monitor, measure, analyze, and evaluate its environmental performance to report and accurately communicate its environmental performance. The performance indicators of significant environmental aspects should be monitored and measured. As required by the compliance obligations, the performance information shall be communicated internally and externally to the interested parties. The operational heads shall retain appropriate documented information as evidence of the monitoring, measurement, analysis, and evaluation results.

The organization should consider, where appropriate, using laboratories whose testing techniques have been either accredited by a national accreditation body or approved by the regulators. Suppose accreditation or approval is not possible or available. In that case, the organization can consider other suitable methods to verify the accuracy of results, such as split sample analysis, testing of certified reference materials, and proficiency test programs. Monitoring and measuring results should be analyzed and used to identify nonconformity, adherence to limits specified by compliance obligations, performance trends, and opportunities for continual improvement. The instruments used to measure the different environmental parameters should be calibrated and maintained.

Based on the documented information about the monitoring and measurement, the performance of the activities will be analyzed and evaluated during the progress assessment meetings conducted by the management representative. In case of any deviations in the EMS performance from its requirements, operational heads shall propose necessary actions to obtain the EMS objectives. All the deviations in the EMS performance, the changes in key actions to correct it, and their effects shall be documented by the respective operational heads.

9.1.2 Evaluation of compliance

The compliance obligations are to be monitored, measured, analyzed and reviewed against its requirements per the EMS scope. This process can help the organization demonstrate its commitment to fulfilling compliance obligations, understand its

compliance status, reduce the potential for regulatory violations and avoid adverse action from its interested parties. The compliance evaluation shall be made once in 3 months or any time less than 3 months as appropriate by the organization. The organization shall consider internal and external parties to conduct a compliance evaluation of the EMS. Where a failure or potential failure to fulfil a compliance obligation is identified, the organization should take action. The organization's nonconformity and corrective action process could be used to deal with needed corrections. The reports of the compliance evaluations shall be submitted to the top management to review the organization's fulfilment of its compliance obligations and maintain awareness of the organization's compliance status. The management representative should retain the documents as evidence of compliance obligations.

9.2 Internal audit

9.2.1 General

Internal audits are conducted to evaluate, measure, report, and suggest corrective actions to obtain the EMS requirements. The scope of the internal audit shall be planned and communicated to the concerned authorities. The internal audit report shall be summarized and presented to the top management during the management review. Based on the internal audit report, the top management directs the concerned authorities to implement the corrective actions and overcome all the nonconformities.

9.2.2 Internal audit programme

As per the standard requirement, the SRMIST provided training for 18 internal auditors to conduct an internal audit about ISO 14001:2015 certification. Internal audits shall be conducted once in six months or earlier based on the appropriate need to obtain the following objectives:

- Conformity with respective to the requirements
- Effectiveness with respective to the objectives
- Opportunities with respective to the improvement
- Compliance with respective to the regulatory requirements

Internal auditors are specialized in different disciplines. The internal auditors audit the campus life in batches; a lead internal auditor shall direct each batch. The management representative will communicate the scope of every audit and its schedule

to the internal auditors in advance. In the initial phase, the internal auditors shall conduct the gap analysis to assess the present condition of the EMS and report to the management representative. The observations shall be recorded in the Audit evidence / Process Notes presented in Annexure 10.

9.3 Management review

The top management of SRMIST shall review the organization's environmental management system at planned intervals to ensure its continuing suitability, adequacy, and effectiveness. Preferably the management reviews are conducted after the internal or external audits. The EMS Coordinator shall report the status of EMS based on the summary of internal/external audits to the top management.

The top management conducts the management review with the operational heads, lead internal auditor, EMS Coordinators, and other members as decided by the top management. The process requirements and outputs of the management review is presented in figure 3. The management representative retains the documented information as evidence of management reviews.

10. IMPROVEMENT

10.1 General

Improvement is integral to an effective environmental management system. The top management ensures that the opportunities are explored, and necessary actions are addressed. This shall be possible by controlling and correcting nonconformity and enhancing its environmental performance through continual improvement of its environmental management system's suitability, adequacy, and effectiveness. The opportunities shall be identified in the process as mentioned in the figure 4.

10.2 Nonconformity and corrective action

Nonconformity is the non-fulfilment of a requirement that can be stated concerning the EMS or environmental performance. A systematic approach for identifying nonconformity, acting to mitigate any adverse environmental impact, analyzing the cause of the nonconformity, and taking corrective action is required to maintain an effective EMS. The nonconformity shall be recorded in the nonconformity report as presented in annexure 11.

The major nonconformities should be resolved and followed by minor nonconformities. If a potential problem is identified, but no actual nonconformity exists, action can be taken to prevent a nonconformity from occurring. The track record of nonconformities is to be maintained and monitored in order to avoid its re-occurrence.

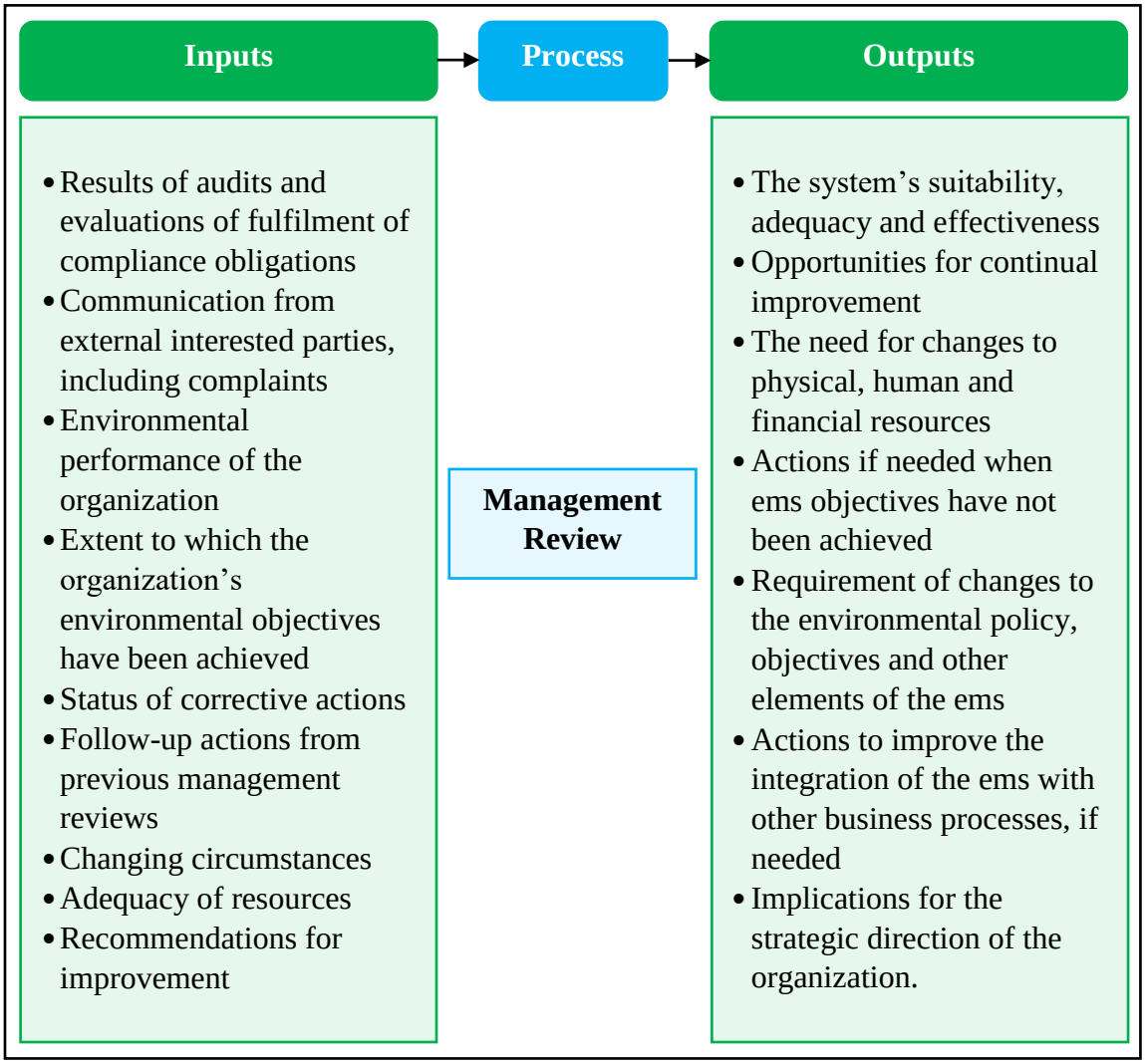

Figure 3. Process requirements of management review

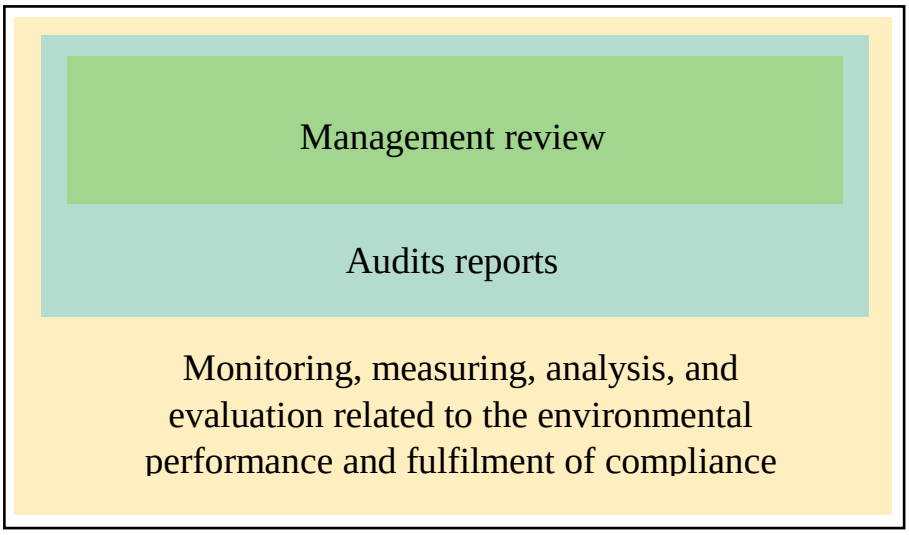

Figure 4. Sources of opportunities

10.3 Continual improvement

The top management of SRMIST is directly involved in this evaluation through the management review process. Continual improvement is a crucial attribute of an effective environmental management system to enhance environmental performance. The continual improvement involves two stages – opportunities for improvement and implementation of continual improvement. Opportunities are identified through continuous monitoring and measurement of EMS, internal and external audits, and voluntarily from the stakeholders using the proactive and opportunities form.

The continual improvement involves the evaluation of the identified opportunities for improvement to determine the actions to be taken. Those actions should be planned, and changes to the EMS should be implemented accordingly. The overall process from identifying the nonconformities and implementing corrective action is presented in the figure 5. The correction action status shall be recorded using the non-conformity report as mentioned in the annexure 11.

The EMS manual shall be considered as primary reference for the activities related to the EMS scope. The EMS manual shall be updated annually and maintained by the management representative.

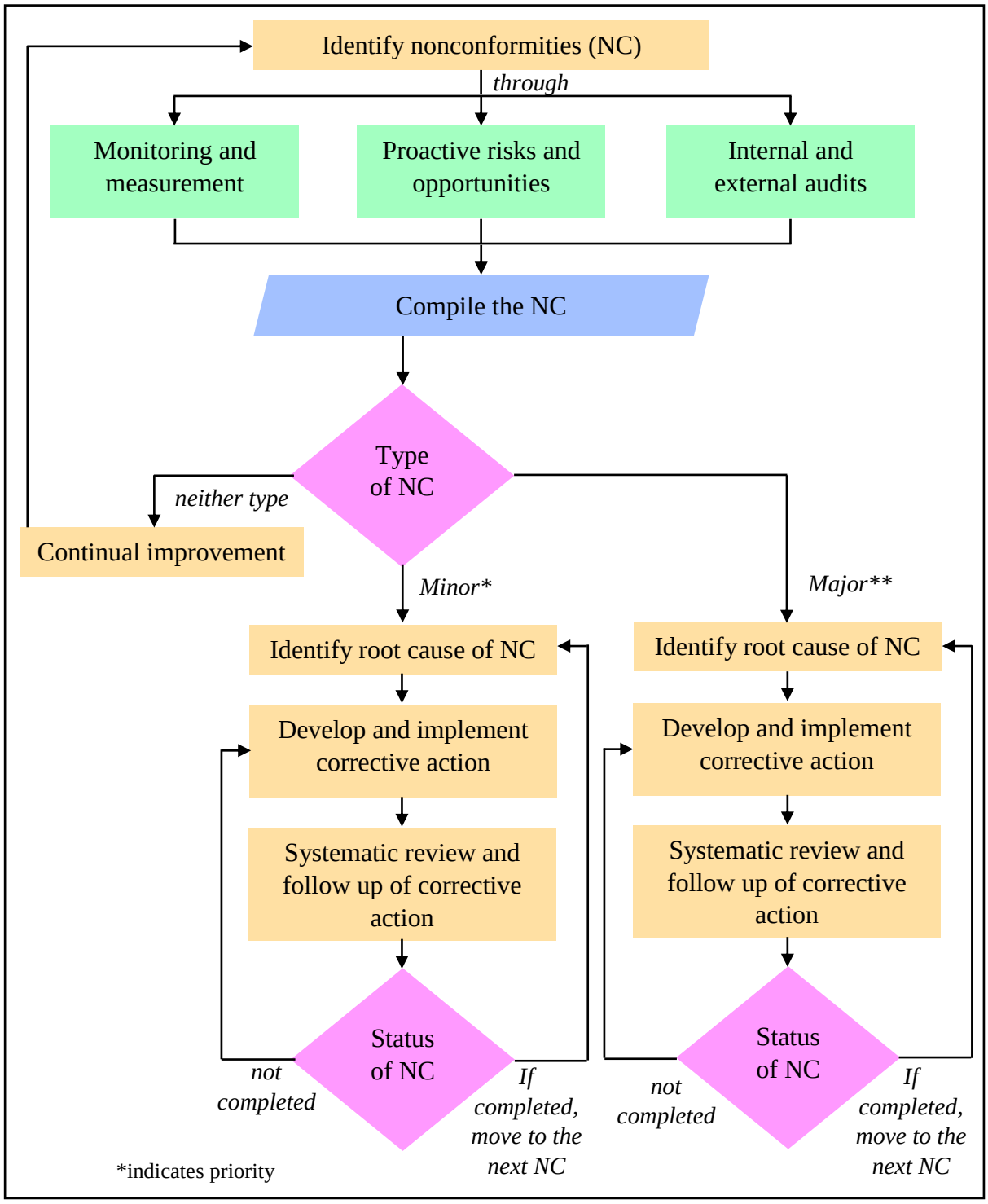

Figure 5. Sources of opportunities

Bibliography

[1] ISO 14001:2015, Environmental management systems — Requirements with guidance for use.

[2] ISO 14004:2016, Environmental Management Systems — General Guidelines on Implementation.

[3] ISO 14005, Environmental management systems — Guidelines for the phased implementation of an environmental management system, including the use of environmental performance evaluation.

[4] ISO 14006, Environmental management systems — Guidelines for incorporating eco-design.

[5] ISO 19011:2011, Guidelines for auditing management systems.

[6] Oxford Brookes University - Environmental Management System. 2019. [Online]. Available: https://www.brookes.ac.uk/sustainability/environmental-management.

[7] "Loughborough University - Environmental Management System." https://www.lboro.ac.uk/services/sustainability/policies-guidance.

[8] T. J. Price, Environmental Management Systems. Create space Independent Pub; 2nd edition (8 October 2016), 2016. [Online]. Available: https://www.amazon.in/Environmental-Management-Systems, second edition ISBN1539398242.

[9] A. J. Edwards, ISO 14001 Environmental Certification Step by Step, second edition. Elsevier, 2013. [Online]. Available: https://www.sciencedirect.com/book/9780750661003/iso-14001-environmental-certification-step-by-step.

[10] Saint John Energy - ISO 14001 Environmental Management System (EMS) Manual. 2018. [Online]. Available: https://www.sjenergy.com.

List of annexure documents

Annexure 1 – External and Internal Issues

Annexure 2 – EMS Roles and Responsibilities

Annexure 3 – Life Cycle Perspective

Annexure 4 – Needs and Expectations of Interested Parties

Annexure 5 – Risk Identification

Annexure 6 – Environmental Impact Assessment

Annexure 7 – Compliance Obligations Register

Annexure 8 – Proactive Risk and Opportunity form

Annexure 9 – Emergency Preparedness and Response Plan

Annexure 10 – Audit Evidence / Process Notes (ISO 14001:2015)

Annexure 11– Nonconformity Report (NCR)

Annexure 12 – Environmental Process Map